

## CLAIMS

We claim:

- 5 1. A computer-implemented table styles inference engine for determining a table style for a table, the engine operable to perform the steps of:  
determining an optimal uniform body pattern for the table;  
determining an optimal row banding body pattern for the table;  
determining an optimal column banding body pattern for the table; and  
10 determining an overall optimal body pattern for the table.
- 15 2. The table styles inference engine of claim 1 further operable to perform the step of:  
saving the overall optimal body pattern as a table style for the table.
- 20 3. The table styles inference engine of claim 1 wherein the step of determining an overall optimal body pattern for the table comprises determining whether the optimal uniform body pattern, optimal row banding body pattern or optimal column banding body pattern most closely matches the table.

4. The table styles inference engine of claim 1 wherein the step of determining an optimal uniform body pattern for the table comprises:

determining which of the following most closely matches the table: a uniform body pattern with no special rows and columns or a uniform body pattern with special row(s) and/or column(s), wherein a special row or special column comprises at least one cell with a different cell style than the majority cell style of the uniform body pattern; and

saving the uniform body pattern that most closely matches the table as the optimal uniform body pattern for the table.

5. The table styles inference engine of claim 2 wherein the table style comprises a plurality of cell styles.

6. A computer-implemented method for determining an optimal uniform body pattern for a table in an electronic document, wherein the table comprises a plurality of rows and a plurality of columns, the method comprising the steps of:

- 5 determining a majority cell style for the table;
- determining the number of odd cells in the table, wherein an odd cell comprises a cell that does not match the majority cell style;
- saving the number of odd cells as a first count;
- assuming a special row and/or column, wherein a special row or column
- 10 comprises a row or column comprising cells with cell styles not matching the majority cell style, determining the following:
  - (a) determining a majority cell style for the table excluding cells in the rows and/or columns that are assumed special;
  - (b) determining the number of odd cells in the table excluding cells in
  - 15 the rows and/or columns assumed to be special, wherein an odd cell comprises a cell that does not match the majority cell style, and saving the number of odd cells as a second count;
  - (c) for each row assumed to be special, determining a row majority cell style, determining a number of odd cells in the special row and adding the number to
  - 20 the second count;
  - (d) for each column assumed to be special, determining a column majority cell style, determining a number of odd cells in the special column and adding the number to the second count;
  - (e) for each corner cell, determining whether the row and column of
  - 25 the corner cell were both assumed to be special and, if so, then subtracting one from the second count;
  - (f) saving the second count in association with an indication of the assumed special row and/or column;

(g) repeating steps (a)-(f) for each combination of special row and/or column and determining which assumption has the lowest second count; and determining between the first count and second count which is lowest and saving the assumed body pattern associated with the lowest count as the optimal uniform body pattern for the table.

7. The method of claim 6 wherein the majority cell style is the cell style most prevalent in the table.

8. The method of claim 6 wherein the majority cell style comprises a plurality of table style properties.

9. The method of claim 8 wherein the plurality of table style properties comprises row borders, row shading, cell bottom padding, cell fit text, cell left padding, cell right padding, cell top padding, cell vertical alignment, cell wordwrap, text font properties and text paragraph properties.

10. The method of claim 6 wherein the optimal uniform body pattern is saved as a table style.

11. The method of claim 10 wherein the table style comprises a plurality of cell styles.

12. A computer-implemented method for analyzing a table assuming a row banding body pattern and no special columns, wherein the table comprises a plurality of rows and a plurality of columns, the method comprising the steps of:

(a) assuming a valid  $n$  and a valid  $w$ , wherein  $n$  is the number of different repeating row bands and  $w$  is the number of rows per row band and wherein the product of  $n$  and  $w$  is less than the or equal to the number of rows in the table;

(b) determining a majority cell style for each row;

(c) removing all rows, except the first and last row in the table, whose majority cell style is not among the most common  $n$  majority cell styles in the table;

(d) saving the total number of removed cells as a count for the assumed  $n$  and  $w$ ;

(e) removing all rows in excess of  $w$  for every band and adding the total number of removed cells to the count;

(f) for every band with less than  $w$  rows, except the last band in the table, adding the number of cells in the first row of the band to the count;

(g) for all remaining rows, determining the number of odd cells not matching the majority cell style for the row and adding the number to the count;

(h) storing the count for the assumed  $n$  and  $w$  in association with the assumed row banding body pattern; and

(i) repeating steps (a)-(h) for every valid  $n$  and  $w$ .

13. The method of claim 12 further comprising the steps of comparing the plurality of counts and storing the assumed row banding body pattern associated with the lowest count as the optimal row banding body pattern with no special columns.

14. A computer-implemented method for analyzing a table assuming a row banding body pattern and assuming special columns, wherein the table comprises a plurality of rows and a plurality of columns, the method comprising the steps of:

(a) assuming a valid  $n$  and a valid  $w$ , wherein  $n$  is the number of different repeating row bands and  $w$  is the number of rows per row band and wherein the product of  $n$  and  $w$  is less than the or equal to the number of rows in the table;

(b) determining a majority cell style for each row excluding any cells shared with any assumed special columns;

(c) removing any rows whose majority cell style is not among the most common  $n$  row majority cell styles;

(d) saving the total number of removed cells as a count for the assumed  $n$  and  $w$ ;

(e) removing all rows in excess of  $w$  for every band and adding the total number of removed cells to the count;

(f) for every band with less than  $w$  rows, except the last band in the table, adding the number of cells in the first row of the band to the count;

(g) for all remaining rows, determining the number of odd cells not matching the majority cell style for the row and adding the number to the count;

(h) for each column assumed to be special, determine the majority cell style for the column, determine the number of odd cells in the column and add the total to the count;

(i) storing the count for the assumed  $n$  and  $w$ ; and

(j) repeating steps (a)-(i) for every valid  $n$  and  $w$ .

15. A computer-implemented method for analyzing a table assuming a column banding body pattern and no special rows, wherein the table comprises a plurality of rows and a plurality of columns, the method comprising the steps of:

(a) assuming a valid  $n$  and a valid  $w$ , wherein  $n$  is the number of different repeating column bands and  $w$  is the number of columns per column band and wherein the product of  $n$  and  $w$  is less than the or equal to the number of columns in the table;

(b) determining a majority cell style for each column;

(c) removing all columns, except the first and last column in the table, whose majority cell style is not among the most common  $n$  majority cell styles in the table;

(d) saving the total number of removed cells as a count for the assumed  $n$  and  $w$ ;

(e) removing all columns in excess of  $w$  for every band and adding the total number of removed cells to the count;

(f) for every band with less than  $w$  columns, except the last band in the table, adding the number of cells in the first column of the band to the count;

(g) for all remaining columns, determining the number of odd cells not matching the majority cell style for the column and adding the number to the count;

(h) storing the count for the assumed  $n$  and  $w$ ; and

(i) repeating steps (a)-(h) for every valid  $n$  and  $w$ .

16. A computer-implemented method for analyzing a table assuming a column banding body pattern and assuming special rows, wherein the table comprises a plurality of rows and a plurality of columns, the method comprising the steps of:

(a) assuming a valid  $n$  and a valid  $w$ , wherein  $n$  is the number of different repeating column bands and  $w$  is the number of columns per column band and wherein the product of  $n$  and  $w$  is less than the or equal to the number of columns in the table;

(b) determining a majority cell style for each column excluding any cells shared with any assumed special rows;

(c) removing any columns whose majority cell style is not among the most common  $n$  column majority cell styles;

(d) saving the total number of removed cells as a count for the assumed  $n$  and  $w$ ;

(e) removing all columns in excess of  $w$  for every band and adding the total number of removed cells to the count;

(f) for every band with less than  $w$  columns, except the last band in the table, adding the number of cells in the first row of the band to the count;

(g) for all remaining columns, determining the number of odd cells not matching the majority cell style for the column and adding the number to the count;

(h) for each row assumed to be special, determine the majority cell style for the row and determine the number of odd cells in the row and add the total to the count;

(i) storing the count for the assumed  $n$  and  $w$ ; and

(j) repeating steps (a)-(i) for every valid  $n$  and  $w$ .